

### **AMENDED CLAIMS**

1.-4. (cancelled)

5.(original) An isolated nucleic acid molecule comprising a nucleotide sequence that:

(a) encodes the amino acid sequence shown in SEQ ID NO: 9; and

(b) hybridizes under stringent conditions to the nucleotide sequence of SEQ ID NO: 8 or the complement thereof.

6.(original) An isolated nucleic acid molecule comprising a nucleotide sequence encoding the amino acid sequence shown in SEQ ID NO:9.

7.(cancelled)

8. (new) An isolated nucleic acid molecule comprising the nucleotide sequence shown in SEQ ID NO:8.

9. (new) A recombinant expression vector comprising a nucleotide sequence encoding the amino acid sequence shown in SEQ ID NO:9.

10. (new) The recombinant expression vector of claim 9 wherein said nucleotide sequence is that shown in SEQ ID NO:8.

11. (new) A host cell comprising the vector of claim 9.

12. (new) A host cell comprising the vector of claim 10.

### **I. Restriction Requirement**

The Examiner has determined that the original claims are directed to three separate and distinct inventions under 35 U.S.C. § 121, as follows:

Group I: Claims 1-3, allegedly drawn to isolated DNA molecules encoding a human kinase having SEQ ID NO: 2, classified in class 536, subclass 23.2.

Group II: Claims 4-5(6), allegedly drawn to isolated DNA molecules encoding a human kinase having SEQ ID NO: 9, classified in class 536, subclass 23.2.

Group III: Claim 7, allegedly drawn to isolated DNA molecules encoding SEQ ID NO: 11, classified in class 536, subclass 23.2.

### **II. Response to Restriction Requirement**

In response to the Restriction Requirement delivered over the telephone on or about May 24, 2004, Applicants elected without traverse to prosecute the claims of Group II (Claims 4-5(6), allegedly drawn to isolated DNA molecules encoding a human kinase having SEQ ID NO: 9, classified in class 536, subclass 23.2). Applicants further elect, pursuant to 35 U.S.C. § 121, the species of SEQ ID NO: 9 (and related nucleic acid SEQ ID NO: 8) for initial examination on the merits. Elected claims 4-6, and new claims 8-12 read on the elected species. Applicants understand their species election is being made solely to expedite examination of the application, and that they are entitled to consideration of additional species upon allowance of a generic claim. Applicants reserve the right to refile claims to the non-elected inventions in one or more future applications retaining the priority date of the present case and the earlier cited priority applications.

### **III. Status of the Claims**

Claims 1-3 and 7 have been cancelled entirely without prejudice and without disclaimer, as being drawn to a non-elected inventions. Claim 4 has also been cancelled entirely without prejudice

and without disclaimer. New claims 8 -12 have been added to better claim the present invention. As a result, claims 5-6 and 8-12 are therefore currently pending.

#### **IV. Support for Amendments**

The specification has been amended to include reference to the issued U.S. Patent.

New Claim 8 finds support throughout the specification, claims and sequence listing as originally filed, with particular support being found in original Claim 6 and SEQ ID NO: 8.

New Claims 9 and 10 find support throughout the specification, claims and sequence listing as originally filed, with particular support being found at least at page 13, lines 18-25 and SEQ ID NOS: 9 and 8, respectively.

New Claims 11 and 12 find support throughout the specification, claims and sequence listing as originally filed, with particular support being found at least at page 15, lines 25-32 and SEQ ID NOS: 9 and 8, respectively.

It will, therefore, be understood that no new matter is included within the amended specification or the newly added claims and entry is therefore respectfully requested.

#### **V. Amendment and Request to Correct Inventorship**

As claims have been cancelled in response to the Restriction Requirement, inventorship must be amended in compliance with 37 C.F.R. § 1.48(b). Applicant respectfully requests amendment of inventorship under 37 C.F.R. § 1.48(b) and 148(b)1 in order to remove the inventors of the non-elected claims since their invention is no longer being claimed in the present application as amended. The inventors *that are requested to be removed* as a result of the cancellation of the non-elected claims in this response to restriction requirement are Yi Hu, Boris Nepomnichy and Xiaoming Wang . The inventors of the remaining claims are therefore, Gregory Donoho, John Scoville and D. Wade Walke.

The PTO is authorized to charge the fee required under 37 C.F.R. § 1.17(i) for this Amendment and Request to Correct Inventorship in a non-provisional application under 37 C.F.R. § 1.48(b) to Deposit Account No. 50-0892. Although Applicants believe that no additional fees are due

in connection with this response, the Commissioner is authorized to charge any underpayment or credit any overpayment required with this response to Deposit Account No. 50-0892.

**VI. Response to Objections**

The Examiner objects to the priority statement in the application, allegedly because it is incomplete. Applicants note that the Preliminary Amendment filed with this application remedied many of these deficiencies, however, it did not include the U.S. Patent number of the parent case, because it was not available at the time of filing. Therefore, Applicants have requested that the first paragraph of the instant application be replaced with one that remedies all deficiencies.

**VII. Response to Rejection of Claims Under 35 U.S.C. § 112, first paragraph**

The Action rejects Claim 4 under 35 U.S.C. § 112, first paragraph, as allegedly not providing enablement for the full scope of the claimed invention comprising a genus of at least 24 contiguous nucleotides of SEQ ID NO:8. Applicants respectfully completely disagree.

The Action states that Claim 4 is not enabled because “the skilled artisan would not know how to use any polynucleotide comprising as least 24 nucleotides of SEQ ID NO:8 absent undue experimentation, because the lack of functional and structural characteristics of said polynucleotides makes the probability of success in obtaining the claimed invention very low” (the Action at page 9). Applicants point out that the above comment is **completely irrelevant** to determining whether the claimed compositions meet the legal requirements for patentability under 35 U.S.C. § 112, first paragraph. There is absolutely **no** requirement that all species of an invention must have all of the exact same properties. It is well established that the enablement requirement is met if **any** use of the invention (or in this case, certain species of the invention) is provided (*In re Nelson*, 126 USPQ 242 (CCPA 1960); *Cross v. Iizuka*, 224 USPQ 739 (Fed. Cir. 1985)). “The enablement requirement is met if the description enables any mode of making and using the invention.” *Johns Hopkins Univ. v. CellPro, Inc.*, 47 USPQ2d 1705, 1719 (Fed. Cir. 1998), citing *Engel Indus., Inc. v. Lockformer Co.*, 20 USPQ2d 1300, 1304 (Fed. Cir. 1991). The Examiner has already conceded that the specification is “while being enabling for SEQ ID NO:8” (the Action at page 3). Thus, the enablement issue should

be resolved. Enablement only requires that the specification describe a practical use for the composition defined in the claims, and that a skilled artisan be able to make and use the claimed DNA segments without undue experimentation. Accordingly, by the Examiner's own admission, the § 112 requirement has certainly been met.

The Action seems to contend that the specification provides insufficient guidance regarding the biological function or activity of certain of the claimed compositions. However, such an enablement standard conflicts with established patent law. As discussed *In re Brana*, 34 USPQ2d 1436 (Fed. Cir. 1995; "*Brana*"), the Federal Circuit admonished the P.T.O. for confusing "the requirements under the law for obtaining a patent with the requirements for obtaining government approval to market a particular drug for human consumption". *Brana* at 1442.

The Examiner cites *In re Wands* (8 USPQ 2d 1400 (Fed. Cir. 1988); "*Wands*") for the proposition that the present invention could not be practiced without "undue experimentation". However, it is important to remember that in assessing the question of whether undue experimentation would be required in order to practice the claimed invention, the key term is "undue", not "experimentation". *In re Angstadt and Griffin*, 190 USPQ 214 (CCPA 1976). In *Wands*, the P.T.O. took the position that the applicant failed to demonstrate that the disclosed biological processes of immunization and antibody selection could reproducibly result in a useful biological product (antibodies from hybridomas) within the scope of the claims. In its decision overturning the P.T.O.'s rejection, the Federal Circuit found that Wands' demonstration of success in four out of nine cell lines screened was sufficient to support a conclusion of enablement. The court emphasized that the need for some experimentation requiring, *e.g.*, production of the biological material followed by routine screening, was not a basis for a finding of non-enablement, stating:

Disclosure in application for the immunoassay method patent does not fail to meet enablement requirement of 35 USC 112 by requiring 'undue experimentation,' even though production of monoclonal antibodies necessary to practice invention first requires production and screening of numerous antibody producing cells or 'hybridomas,' since practitioners of art are prepared to screen negative hybridomas in order to find those that produce desired antibodies, since in monoclonal antibody art one 'experiment' is not simply screening of one hybridoma but rather is entire attempt

to make desired antibody, and since record indicates that amount of effort needed to obtain desired antibodies is not excessive, in view of Applicants' success in each attempt to produce antibody that satisfied all claim limitations.

*Wands* at 1400. Thus, the need for some experimentation does not render the claimed invention unpatentable under 35 U.S.C. § 112, first paragraph. Indeed, a considerable amount of experimentation may be permissible if such experimentation is routinely practiced in the art. *In re Angstadt and Griffin, supra; Amgen, Inc. v. Chugai Pharmaceutical Co., Ltd.*, 18 USPQ2d 1016 (Fed. Cir. 1991).

Applicants additionally point out that significant commercial exploitation of nucleic acid sequences requires no more information than the nucleic acid sequence itself. Applications ranging from gene expression analysis or profiling (utilizing, for example, arrays of short, overlapping or non-overlapping, oligonucleotides and DNA chips, as described in the specification as filed) to chromosomal mapping (utilizing, for example, short oligonucleotide probes or full length DNA sequences, as described in the specification as filed) are practiced utilizing nucleic acid sequences and techniques that are well-known to those of skill in the art. The widespread commercial exploitation of nucleic acid sequence information points to the level of skill in the art, and the enablement provided by disclosures such as the present specification, which include specific nucleic acid sequences and guidance regarding the various uses of such sequences.

The Action questions the teaching and guidance in the specification for certain aspects of the present invention. However, as discussed above, this requirement is completely misplaced. There is sufficient knowledge and technical skill in the art for a skilled artisan to be able to make and use the claimed DNA species in a number of different aspects of the invention entirely without further details in a patent specification. For example, it is not unreasonable to expect a Ph.D. level molecular biologist to be able to use the disclosed sequence to design oligonucleotide probes and primers and use them in, for example, PCR based screening and detection methods to obtain the described sequences and/or determine tissue expression patterns. Nevertheless, the present specification provides highly detailed descriptions of techniques that can be used to accomplish many different aspects of the claimed invention, including recombinant expression, site-specific mutagenesis, *in situ* hybridization, and large

scale nucleic acid screening techniques, and properly incorporates by reference a montage of standard texts into the specification, such as Sambrook *et al.* (*Molecular Cloning, A Laboratory Manual*) and Ausubel *et al.* (*Current Protocols in Molecular Biology*) to provide even further guidance to the skilled artisan. Incorporation of material into the specification by reference is proper. *Ex parte Schwarze*, 151 USPQ 426 (PTO Bd. App. 1966). The § 112, first paragraph rejection is thus *prima facie* improper:

As a matter of patent office practice, then, a specification disclosure which contains a teaching of the manner and process of making and using the invention in terms which correspond in scope to those used in describing and defining the subject matter sought to be patented must be taken as in compliance with the enabling requirement of the first paragraph of § 112 unless there is reason to doubt the objective truth of the statements contained therein which must be relied on for enabling support.

*In re Marzocchi*, 169 USPQ 367, 369 (CCPA 1971), emphasis as in original. In any event, an alleged lack of express teaching is insufficient to support a first paragraph rejection where one of skill in the art would know how to perform techniques required to perform at least one aspect of the invention. As a matter of law, it is well settled that a patent need not disclose what is well known in the art. *In re Wands, supra*. In fact, it is preferable that what is well known in the art be omitted from the disclosure. *Hybritech, Inc. v. Monoclonal Antibodies, Inc.*, 231 USPQ 81 (Fed. Cir. 1986). As standard molecular biological techniques are routine in the art, such protocols do not need to be described in detail in the specification.

Furthermore, a specification "need describe the invention only in such detail as to enable a person skilled in the most relevant art to make and use it." *In re Naquin*, 158 USPQ 317, 319 (CCPA 1968); emphasis added. The present claims are thus enabled as they are supported by a specification that provides sufficient description to enable the skilled person to make and use the invention as claimed.

The Action also rejects Claim 4 under 35 U.S.C. § 112, first paragraph, as allegedly containing subject matter that was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the

claimed invention. Applicants again respectfully disagree.

35 U.S.C. § 112, first paragraph, requires that the specification contain a written description of the invention. The Federal Circuit in *Vas-Cath Inc. v. Mahurkar* (19 USPQ2d 1111 (Fed. Cir. 1991); “*Vas-Cath*”) held that an “applicant must convey with reasonable clarity to those skilled in the art that, as of the filing date sought, he or she was in possession of *the invention*.” *Vas-Cath*, at 1117, emphasis in original. However, it is important to note that the above finding uses the terms reasonable clarity to those skilled in the art. Further, the Federal Circuit in *In re Gosteli* (10 USPQ2d 1614 (Fed. Cir. 1989); “*Gosteli*”) held:

Although [the applicant] does not have to describe exactly the subject matter claimed, . . . the description must clearly allow persons of ordinary skill in the art to recognize that [he or she] invented what is claimed.

*Gosteli* at 1618, emphasis added. Additionally, *Utter v. Hiraga* (6 USPQ2d 1709 (Fed. Cir. 1988); “*Utter*”), held “(a) specification may, within the meaning of 35 U.S.C. § 112 ¶1, contain a written description of a broadly claimed invention without describing all species that claim encompasses” (*Utter*, at 1714). Therefore, all Applicants must do to comply with 35 U.S.C. § 112, first paragraph, is to convey the invention with reasonable clarity to the skilled artisan.

The Actions position is that Claim 4 fails to meet the written description requirement because no information, beyond the structural characterization of SEQ ID NO:8 has been provided by Applicants (Action at page 4). However, Applicants respectfully point out that this **structural** characterization is **all that is required** of Claim 4 to meet the written description requirement of 35 U.S.C. § 112, first paragraph. The Examiner further states that Claim 4 lacks sufficient written description support due to the lack of structural **and** functional characteristics of species encompassed by the claim (the Action at page 4). Applicants respectfully point out that the Examiner is clearly using an **improper** standard for compliance with the written description requirement of 35 U.S.C. § 112, first paragraph. In the PTO Guidelines (66 Fed. Reg. at 1106), the PTO has determined that the written description requirement can be met by “show[ing] that an invention is complete by disclosure of sufficiently detailed, relevant identifying characteristics . . . *i.e.*, complete or partial structure, other physical and/or chemical properties, functional characteristics when coupled with a known or disclosed



correlation between function and structure, or some combination of such characteristics” (66 Fed. Reg. at 1106, emphasis added). The Federal Circuit has recently confirmed this aspect of the PTO Guidelines, wherein this exact quote was reproduced (*Enzo Biochem, Inc. v. Gen-Probe, Inc. et al.* (296 F.3d 1316, 63 USPQ2d 1609 (Fed. Cir. 2002))). Taking the exact statement from the PTO Guidelines clause by clause, the written description requirement for a claimed genus may be satisfied through disclosure of sufficiently detailed, relevant identifying characteristics, which are defined as: (a) complete or partial structure; (b) other physical and/or chemical properties; (c) functional characteristics when coupled with a known or disclosed correlation between function and structure; or (d) some combination of such characteristics. In other words, the written description requirement is satisfied by (a), (b), (c) or (d). Clause (a) states that the written description requirement may be satisfied by the disclosure of structure. The Federal Circuit has held that an adequate description of a chemical genus “requires a precise definition, such as by structure, formula, chemical name or physical properties” sufficient to distinguish the genus from other materials. *Fiers v. Revel*, 25 USPQ2d 1601, 1606 (Fed. Cir. 1993; “*Fiers*”). *Fiers* goes on to hold that the “application satisfies the written description requirement since it sets forth the . . . nucleotide sequence” (*Fiers* at 1607). In other words, provision of a structure and formula - the nucleotide sequence - renders the application in compliance with 35 U.S.C. § 112, first paragraph. Therefore, Claim 4 clearly meets the written description requirement of 35 U.S.C. § 112, first paragraph.

More recently, the standard for complying with the written description requirement in claims involving chemical materials has been explicitly set forth by the Federal Circuit:

In claims involving chemical materials, generic formulae usually indicate with specificity what the generic claims encompass. One skilled in the art can distinguish such a formula from others and can identify many of the species that the claims encompass. Accordingly, such a formula is normally an adequate description of the claimed genus. *Univ. of California v. Eli Lilly and Co.*, 43 USPQ2d 1398, 1406 (Fed. Cir. 1997).

Thus, a claim describing a genus of nucleic acids by structure, formula, chemical name or physical properties sufficient to allow one of ordinary skill in the art to distinguish the genus from other materials meets the written description requirement of 35 U.S.C. § 112, first paragraph. As further elaborated

by the Federal Circuit in *Univ. of California v. Eli Lilly and Co.*:

In claims to genetic material ... a generic statement such as 'vertebrate insulin cDNA' or 'mammalian insulin cDNA', without more, is not an adequate written description of the genus because it does not distinguish the claimed genus from others, except by function. It does not specifically define any of the genes that fall within its definition. It does not define any structural features commonly possessed by members of the genus that distinguish them from others. One skilled in the art cannot, as one can do with a fully described genus, visualize or recognize the identity of members of the genus. (Emphasis added)

Thus, as opposed to the situation set forth in *Univ. of California v. Eli Lilly and Co.* and *Fiers*, the nucleic acid sequences of the present invention are not distinguished on the basis of function (as seemingly required by the Action), or a method of isolation, but in fact are distinguished by structural features - a chemical formula, *i.e.*, the *sequence itself*.

Using the nucleic acid sequences of the present invention (as set forth in the Sequence Listing), the skilled artisan would readily be able to distinguish the claimed nucleic acids from other materials on the basis of the specific structural description provided. Polynucleotides comprising at least 24 contiguous bases of nucleotide sequence first disclosed in SEQ ID NO:8 are within the genus of the instant claims, while those that lack this structural feature lie outside the genus. The claimed genus of polynucleotides is clearly defined in structural terms, which is all that is required in order to meet the written description requirement of 35 U.S.C. § 112, first paragraph. Claim 4 thus meets the written description requirement

**However**, while Applicants in no way agree with the basis of this rejection, but merely to advance this application more quickly to allowance, Applicants have cancelled Claim 4 and thus the rejections under 35 U.S.C. § 112, first paragraph have been rendered moot. Applicants therefore respectfully request that these rejections be withdrawn.

## **VII. Response to Rejection of Claims 1-2 Under 35 U.S.C. § 102(a)**

The Action next rejects Claim 4 under 35 U.S.C. § 102(a), as allegedly anticipated by Carninci, *et al.* (Meth. Enzymol., 303, 19-44, July 1999). While Applicants do not necessarily agree

with the present rejection, as Claim 4 has been cancelled without prejudice and without disclaimer, the rejection of Claim 4 under 35 U.S.C. § 102(a) has been rendered moot and withdrawal of the rejection is respectfully requested.

**IV. Conclusion**

The present document is a full and complete response to the Action. In conclusion, Applicants submit that, in light of the foregoing amendments and remarks, the present case is in condition for allowance, and such favorable action is respectfully requested. Should Examiner Monshipouri have any questions or comments, or believe that certain amendments of the claims might serve to improve their clarity, a telephone call to the undersigned Applicants' representative is earnestly solicited.

Respectfully submitted,

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